THE IDENTITY OF *FUCUS PEPRICARPOS* POIRET

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ABSTRACT - A specimen in the Lamouroux Herbarium in Caen is designated as lectotype of *Fucus pepricarpos* Poiret (1808). Circumstantial evidence suggests that the provenance of Poiret's collection was Australia rather than the Indian Ocean. In agreement with previous authors, we identify this specimen as *Phacelocarpus labillardieri* (Turner) J. Agardh. Since Poiret's name predates *Fucus labillardieri* of Turner (1811), *Phacelocarpus peperocarpos*(1) (Poiret) Wynne, Ardré et Silva comb. nov. is proposed.

RÉSUMÉ - Un spécimen conservé dans l'herbier Lamouroux à Caen est désigné comme lectotype du *Fucus pepricarpos* Poiret (1808). Des preuves indirectes laissent présumer que la provenance de la collection de Poiret serait l'Australie plutôt que l'Océan indien. En accord avec les auteurs antérieurs nous identifions ce spécimen comme *Phacelocarpus labillardieri* (Turner) J. Agardh. Le nom donné par Poiret étant antérieur à *Fucus labillardieri* de Turner (1811), *Phacelocarpus peperocarpos*(1) (Poiret) Wynne, Ardré et Silva comb. nov. est proposé.

KEY WORDS : *Fucus pepricarpos, Phacelocarpus labillardieri, P. peperocarpos* comb. nov.

INTRODUCTION

The identity of *Fucus pepricarpos* (Poiret, 1808) has long remained uncertain. Referring to it as the "varec grain de poivre" [= the grain-of-pepper seaweed], Poiret stated that this plant grew on "les côtes de l'Ile-de-France(2) ou de Madagascar". The type was based on material in the herbarium of Du Petit-Thouars. Lamouroux (1813) transferred *Fucus pepricarpos* to his new genus *Plocamium* (and incorrectly changed the epithet to *pipericarpos*). This move appears to be the only nomenclatural adjustment since Poiret's original account.

Various authors, including C. Agardh (1822), Kützing (1849), J. Agardh (1852), and De Toni (1900), have cited *Fucus pepricarpos* ["*pipericarpos*"] as a taxonomic synonym of *Phacelocarpus [Sphaerococcus - Euctenodus] labillardieri* (Turner) J. Agardh. If indeed these two entities are taxonomic synonyms, the name *Fucus pep-*

(1) The change of epithet is explained in the footnote to p. 41.

(2) presently Mauritius.

ricarpos Poiret (1808) predates *Fucus labillardieri* Turner (1811), a fact which seems to have been universally ignored. By an examination of the type specimen, we hoped to clarify its relationship to *Phacelocarpus labillardieri*.

MATERIAL AND METHODS

Papenfuss (1968) indicated that the Du Petit-Thouars Herbarium is now housed in the cryptogamic collection of the Natural History Museum of Paris (= PC) . A search by Dr. Françoise Ardré of the various herbaria in PC, including those both in the Laboratoire de Cryptogamie and the Laboratoire de Phanérogamie, proved fruitless. Recalling that Lamouroux (1813) had assigned Poiret's taxon to *Plocamium*, Dr. Ardré requested that Dr. Chantal Billard of Caen check the Lamouroux Herbarium (CN). Dr. Billard located such a specimen in the *Phacelocarpus labillardieri* folder.

OBSERVATIONS

The specimen in CN (Fig. 1 & 2) bore the following étiquette: "*Fu. pipericarpos* poir. *plocamium pipericarpos*". J.C. Jolinon, Conservator in the Laboratoire de Phanérogamie, Paris, has confirmed that handwriting is that of Lamouroux. There is no indication of the provenance of this collection. Despite the lack of any handwriting of Poiret, circumstantial evidence points to the acceptance of this material as type material used by Poiret. We therefore designate it as the lectotype for *Fucus pepricarpos* Poiret (1808).

The specimen, although incomplete in the absence of a basal portion, is approximately 8cm in length. The indeterminate axes, which are irregularly branched to two or possibly three orders, bear distichously and densely arranged laterals, which are awl-shaped and terminate in an acute tip. These laterals are alternately arranged, and the most distal ones curl over the apex of the main axis (Fig. 3). The width of these main axes, including the fringing laterals, is approximately 4.2 mm. Glandular cells are scattered in the cortex, but they are not prominent (Fig. 6). Pedicellate cystocarps are present, arising along the main axes in the axils of the lateral branchlets (Fig. 2, 4 & 5). This material is in full agreement with Poiret's (1808) description of *Fucus pepricarpos:*

Fucus fronde subcompressa, ramosa, ramis alternis subsimplicibus; foliolis minimis, suboppositis, tuberculis globosis, subpedunculatis, lateralibus (N).

In his discussion of his new species, Poiret called attention to several features which it shared with the superficially similar *Fucus asparagoides* Woodw. [*Bonnemaisonia asparagoides* (Woodw.) C. Ag.], including the globular tubercles, which were mostly pedicellate, and the flat, membranous frond bearing dentate to ciliate branchlets, coming to subulate points. The numerous, small, blackish fructifications, located laterally along the axes, reminded Poiret of pepper grains. The material is also in full agreement with the alga known as *Phacelocarpus labillardieri* (Turner) J. Agardh (Searles, 1968; Fuhrer, 1981), as several early workers have already pointed out.

DISCUSSION

Eight species were assigned to *Phacelocarpus* by Searles (1968). He characterized the genus as morphologically diverse and with its primary occurrence in the southern hemisphere. Australian endemics include *P. alatus* Harvey, *P. apodus* J.

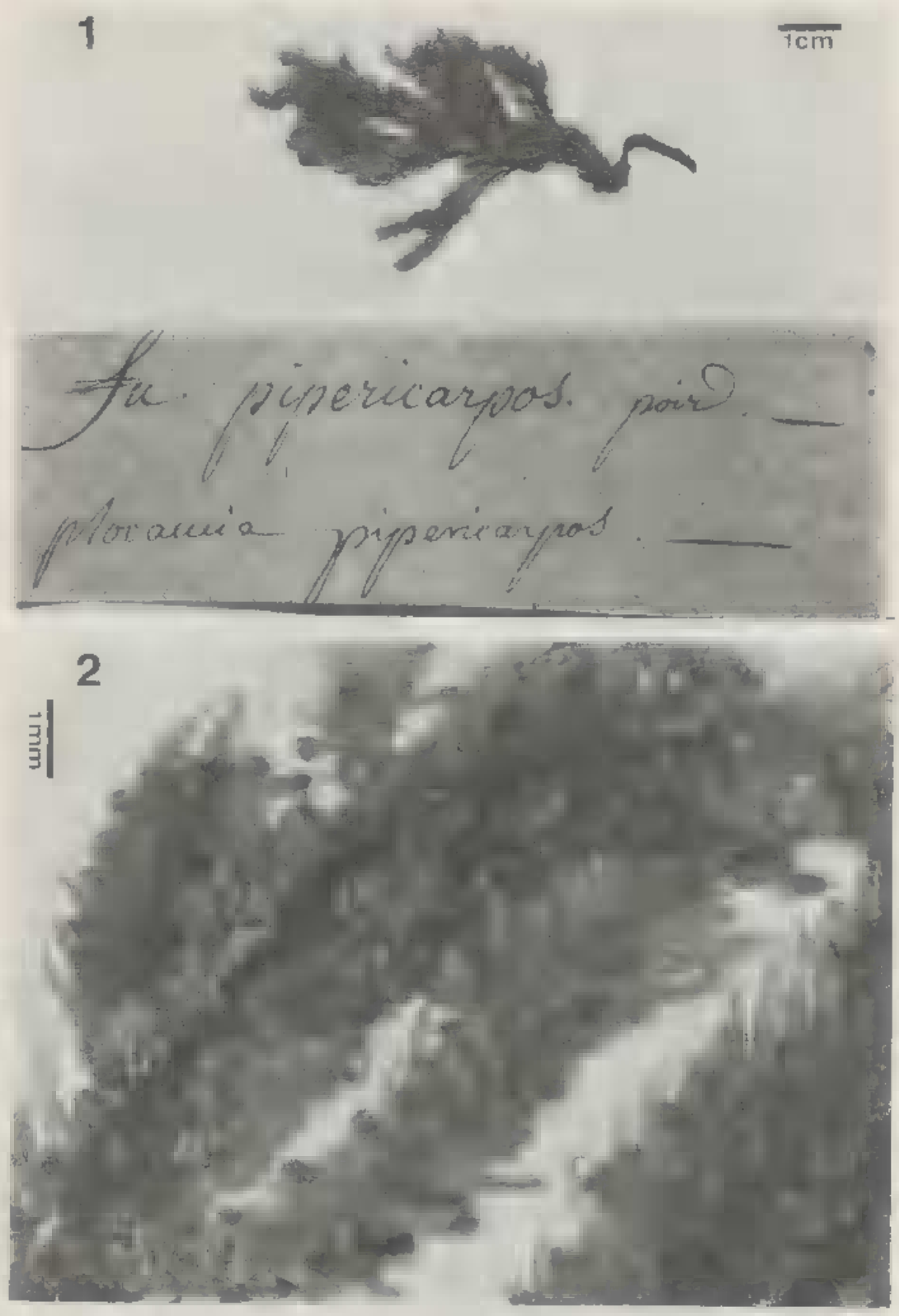

Fig. 1-2: *Fucus pepricarpos* Poiret. Lectotype (Herb. Lamouroux in Caen). Fig. 1. The complete specimen and etiquette written in the hand of Lamouroux. Fig. 2. Detail of lectotype.

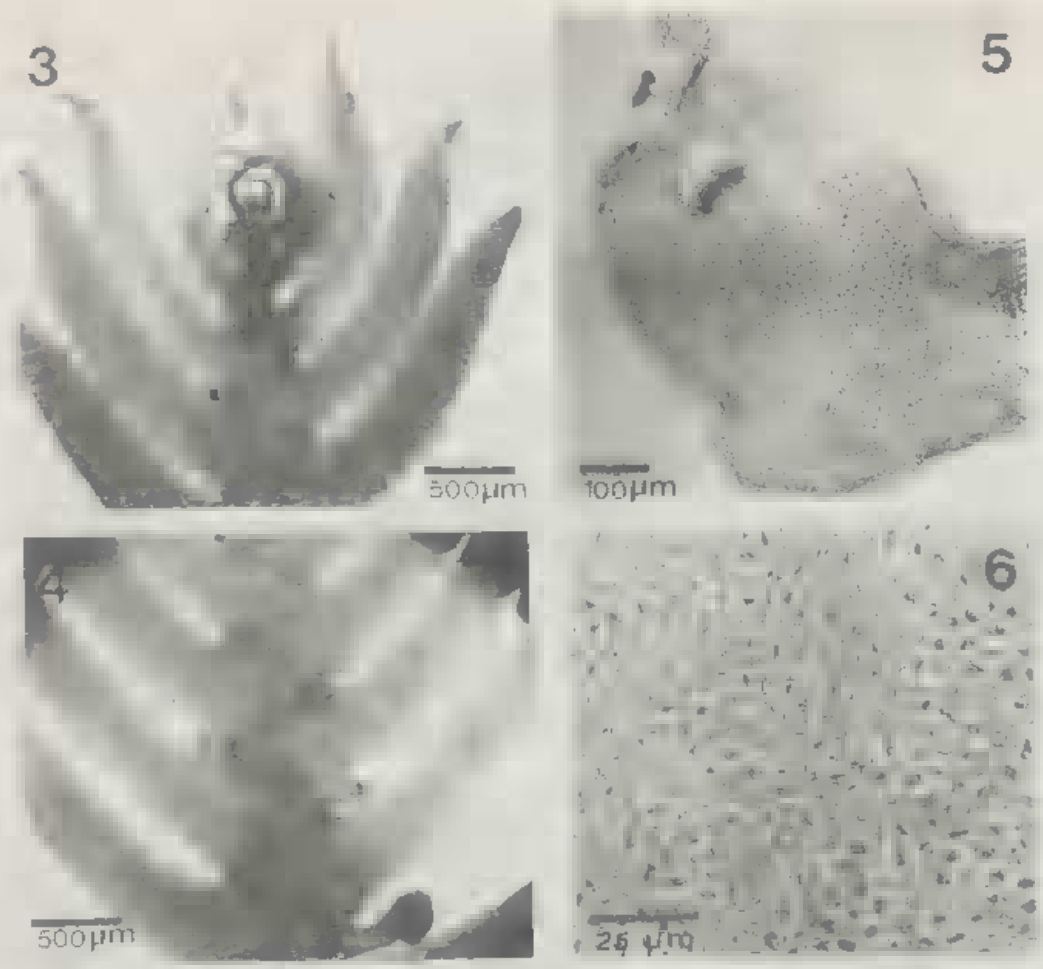

Fig. 3-6: *Fucus pepricarpos* Poiret. Lectotype (Herb. Lamouroux in Caen). Fig. 3. Apex of an axis with indeterminate growth. Fig. 4. Portion of an axis presenting cystocarps at different stages of development. Fig. 5. Longitudinal section of a well developed cystocarp. Fig. 6. Glandular cells in surface view of thallus.

Agardh, *P. complanatus* Harvey, *P. labillardieri* (Turner) J. Agardh and *P. sessilis* Harvey ex J. Agardh. *Phacelocarpus oligacanthus* Kützing and *P. tortuosus* Endlicher et Diesing are restricted to South Africa. *Phacelocarpus japonicus* Okamura occurs in Japan. Various authors such as Kützing(1849) and J. Agardh (1852) regarded *Fucus pepricarpos* as a taxonomic synonym of *Phacelocarpus labillardieri*, an opinion confirmed by our observations. A problem is that *Fucus pepricarpos* was described by Poiret (1808) apparently from the Indian Ocean whereas *Phacelocarpus labillardieri* is restricted to the Australian flora, according to Searles (1968) who discounted the report for South Africa by Barton (1893). Species that are known from Madagascar and/or Mauritius (the alleged provenance of Poiret's alga) include *P. tristichus*, which was described by J. Agardh (1885) from Mauritius; Kylin (1932) depicted the type specimen. This appears to be the only species of *Phacelocarpus* known from Mauritius. Borgesen (1943) referred to *P. tristichus* as being "the smallest and most graceful of all known *Phacelocarpus*", with tristichously arranged pinnae that are conical, somewhat incruved, and longer than the breadth of the stem-like part of the thallus. Al-

though Børgesen (1952) thought that *P. tristichus* was endemic to Mauritius, Searles (1968) broadened its range to include the coast of eastern Africa, namely, Tanzania and Mozambique. Jaasund (1976, 1977) confirmed its occurrence in Tanzania. Searles regarded *Phacelocarpus affinis*, described by Hariot (1902) from Madagascar, as a taxonomic synonym of *P. tristichus*, thus extending its range to that country.

In the flora of Madagascar Andriamampandry (1976) listed the following species of *Phacelocarpus: P. epipolaeus* Holmes [which was treated by Searles (1968) as conspecific with *P. tortuosus* Endlicher et Diesing], *P. tristichus* and ▪ *Phacelocarpus* sp.

It is obvious that *P. labillardieri* does not occur from the regions alleged to be the provenance of Poiret's *Fucus pepricarpos*. One is forced to conclude that Poiret was in error. We feel that it is significant that he wrote "...Ile-de-France ou de Madagascar" only for *F. pepricarpos*, whereas he consistently designated "...Ile de France & de Madagascar" as the provenance for the other species (*F. geniculatus, F. spiniformis*, and *F. amansii*). The "ou" might be interpreted as showing uncertainty in Poiret's mind. Since Australian material, including La Billardière's collection of *Fucus labillardieri*, had become available to various European botanists following the voyage of the *Recherche* and the *Espérance* of 1791-1794 (Ducker, 1979), the evidence strongly suggests that Poiret also received some of this Australian material which served as the basis for his description of *F. pepricarpos*.

The arguments presented above, based both on strong circumstantial evidence as well as the taxonomic identity of *Fucus pepricarpos* and *Phacelocarpus labillardieri*, necessitate the following nomenclatural proposal:

Phacelocarpus peperocarpos (Poiret) Wynne, Ardré et Silva[1]

Basionym: *Fucus pepricarpos* Poiret, 1808, p. 384.

Homotypic synonym: *Plocamium pepricarpos* (Poiret) Lamouroux, 1813, p. 138. ("*pipericarpos*")

Heterotypic synonym: *Phacelocarpus labillardieri* (Turner) J. Agardh, 1852, p. 648.

Basionym: *Fucus labillardieri* Turner, 1811, p. 8, pl. 137.

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(1) In proposing a Greek epithet, Poiret combined the words pepper *(peperi)* and fruit *(carpos)*. The resultant combination, however, was incorrectly spelled *pepricarpos*. Lamouroux (1813: 138) unjustifiably changed the first element to the Latin word *piper* to agree with the combining vowel -i used by Poiret, resulting in *pipericarpos*. The form that we prefer, *peperocarpos*, is linguistically correct and follows the recommendation of Nicolson (1986: 327) in retaining the original transliteration *carpos* rather than using the Latin form *carpus*.

BIBLIOGRAPHY

AGARDH C.A., 1822 - *Species algarum.* Vol. 1, part 2, pp. [i-viii] + 169-531. Lund.

AGARDH J.G., 1852 - *Species genera et ordines Floridearum...* Vol. 2, part 2, pp. 337-720. Lund.

AGARDH J.G., 1885 - Till Algernes Systematik... (Afd. 4). *Lunds Univ. Årsskr.* Afd. 3, 21 (8). 117 + (3) p., 1 pl.

ANDRIAMAMPANDRY A., 1976 - *Recherches sur quelques Rhodophycées à phycocolloïdes de l'Océan Indien occidental.* Doctoral thesis, 3e cycle, Univ. Paris VI.

BARTON E.S., 1893 - A provisional list of the marine algae of the Cape of Good Hope. *J. Bot., London* 31: 53-56, 81-84, 110-114, 138-144, 171-177, 202-210.

BØRGESEN F., 1943 - Some marine algae from Mauritius III. Rhodophyceae. Part 2. Gelidiales, Cryptonemiales, Gigartinales. *Biologiske Meddel. Kgl. Danske Videnskabernes Selsk.* 19(1). 83 + [2] p., 1 pl.

BØRGESEN F., 1952 - Some marine algae from Mauritius. Additions to the parts previously published, IV. *Biologiske Meddel. Kgl. Danske Videnskabernes Selsk.* 18 (19), 72 p., 5 pls.

DeTONI G.B., 1900 - Florideae, Sectio II. In *Sylloge Algarum,* vol IV, pp. 387-776. Padua.

DUCKER S.C., 1979 - History of Australian phycology: the significance of early French exploration. *Brunonia* 2: 19-42.

FUHRER B., 1981 - *Seaweeds of Australia.* Reed, Sydney. [Text edited by I.G. CHRISTIANSON, M.N. CLAYTON & B.M. ALLENDER].

HARIOT P., 1902 - Quelques algues de Madagascar. *Bull. Mus. d'Hist. Nat., Paris* 8: 470-472.

JAASUND E., 1976 - *Intertidal seaweeds in Tanzania - a field guide.* University of Tromso. 160 pp.

JAASUND E., 1977 - Marine algae of Tanzania. VII. *Bot. Mar.* 20: 415-425.

KÜTZING F.T., 1849 - *Species algarum.* Lipsiae.

KYLIN H., 1932 - Die Florideenordnung Gigartinales. *Lunds Univ. Årsskr.* N.F. Avd. 2, 28(8), 88 p., 28 pls.

LAMOUROUX J.V.F., 1813 - Essai sur les genres de la famille des Thalassiophytes non articulées. *Annales du Muséum National d'Histoire Naturelle* [Paris] 20: 21-47, 115-139, 267-293, pls. 7-13.

NICOLSON D.H., 1986 - Species epithets and gender information. *Taxon:* 35: 323-328.

PAPENFUSS G.F., 1968 - Notes on South African marine algae: V. *J.S. Afr. Bot.* 34: 267-287.

POIRET J.L.M., 1808 - Varec. *Fucus. In:* Lamarck J.B. de, *Encyclopédie Methodique. Botanique.* 8: 340-409. Paris.

SEARLES R.B., 1968 - Morphological studies of red algae of the order Gigartinales. *Univ. Calif. Publ. Bot.* 43: vi + 100 p.

TURNER D., 1811 - *Fuci.* Vol. III. London.